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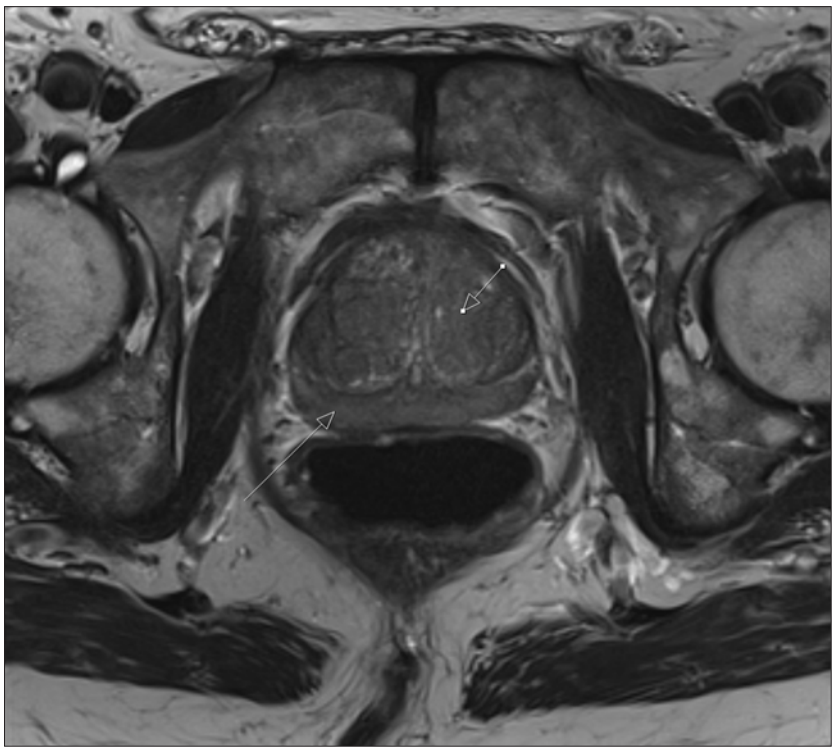
Early recognition and treatment vital in acute prostatitis

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MRI axial T2 mid prostate. Diffuse low signal, in keeping with inflammation. Short arrow: central gland Long arrow: peripheral zone

What are the causes of prostatitis?

How should patients be assessed and investigated?

Which patients should be referred?

PROSTATITIS IS AN INFECTION OR INFLAMMATION OF THE PROSTATE GLAND USUALLY caused by bacteria. It can be classified as chronic or acute depending on whether the symptoms have been present for more or less than three months.

Chronic bacterial prostatitis needs to be differentiated from chronic pelvic pain syndrome (CPPS), where no bacterial cause is identified. These conditions are categorised according to the National Institutes of Health (NIH) classification, see table 1, right.[1] Asymptomatic inflammatory prostatitis is a histological diagnosis made by prostate biopsy or from TURP chippings and is not usually associated with clinical symptoms.

ACUTE PROSTATITIS

Acute prostatitis is an acute bacterial infection of the prostate gland, often associated with other urinary tract infections (UTIs).[2] Patients with acute prostatitis present feeling generally unwell with fever, rigors, pelvic pain (which can include pain in the perineum, suprapubic region, penis, testes, lower back or pain on ejaculation or defecation) and lower urinary tract symptoms (LUTS) i.e. dysuria, frequency, urgency and voiding symptoms.[3] It can also present with, or lead to, acute urinary retention.

Causes

Acute prostatitis occurs most commonly through bacteria entering the prostate from the urinary tract. It may follow infection elsewhere in the urinary tract (epididymitis, urethritis), instrumentation such as endoscopic procedures, transrectal or occasionally transperineal prostate biopsy or catheterisation or occur spontaneously.[4]

Risk factors include benign enlargement of the prostate and urethral stricture, as well as diabetes, immunosuppression and anorectal intercourse.

The most common pathogens in acute prostatitis are Gram-negative urinary pathogens such as *E. coli*, Proteus, Klebsiella and Pseudomonas spp. Occasionally Gram-positive organisms such as Enterococcus can also be responsible. Although rare sexually transmitted infections (STIs) may be a cause and should be considered in high-risk individuals.[3]

History and examination

The aim of assessment is to differentiate prostatitis from other diagnoses »

Table 1

NIH classification of prostatitis and chronic pelvic pain syndrome[1]

Category I Acute bacterial prostatitis
Category II Chronic bacterial prostatitis
Category III Chronic pelvic pain syndrome (CPPS) **IIIA:** Inflammatory CPPS **IIIB:** Non-inflammatory CPPS
Category IV Asymptomatic inflammatory prostatitis

Table 2

Differential diagnoses for acute prostatitis

- Prostatic abscess
- Cystitis
- Urethritis
- Epididymo-orchitis
- Pyelonephritis
- Chronic prostatitis

(see table 2, above), identify patients who require urgent hospital admission, and look for any complications of acute prostatitis such as sepsis, urinary retention[5] or prostatic abscess. It is important to identify those at high risk of deterioration or complications, such as men with diabetes or immunosuppression, in whom the threshold for hospital admission is lower.

Digital rectal examination (DRE) often reveals an extremely tender prostate, and is important in identifying prostatic abscess, characterised by the presence of a boggy, fluctuant mass. Abdominal examination may identify a palpable bladder secondary to urinary retention. If any systemic signs of sepsis are evident, urgent referral to hospital for admission is advised.

Investigation

The key diagnostic investigation is a urine dipstick and a confirmatory midstream urine culture before commencing antibiotics.[6] In acute bacterial prostatitis, prostatic massage for investigation of prostatic secretions is contraindicated because of severe pain and the potential to cause worsening of infection, locally or systemically.[3] In sexually active men, especially those with multiple sexual partners, screening for STIs should be considered.

PSA will often be elevated in acute bacterial prostatitis and other urogenital infections, and hence is not a useful investigation. If the PSA is found to be raised, it usually falls within four weeks of antibiotic treatment and normalises within three months.[2]

Management

Once the urine sample has been sent for culture, antibiotic treatment should be started immediately. A more prolonged 14-day course of oral antibiotics is advised (in the absence of features requiring a referral to secondary care for intravenous antibiotics). The fluoroquinolones ciprofloxacin and ofloxacin are the first-line antibiotic choice, as they are effective against Gram-negative pathogens and penetrate the prostate. Vigilance is required for tendinitis as a potential side effect with these drugs. Trimethoprim may be given as an alternative agent for those unable to take a quinolone, with other second-line options outlined in detail in the latest NICE guidance.[7] Nitrofurantoin is not recommended. Analgesia should include paracetamol as well as an NSAID or mild opioid.

Re-assessment after 24-48 hours is recommended in order to ensure symptomatic improvement, identify deterioration and review the result of the urine culture to confirm appropriate narrow spectrum antibiotic choice.

Referral

Patients who are systemically unwell (tachycardic, hypotensive, fevers, rigors) should be referred urgently to secondary care for intravenous antibiotics and further investigation, as should those failing to respond appropriately or deteriorating on review after 48 hours, see figure 1, opposite.

Complications such as acute urinary retention, and prostatic abscesses can occur and if suspected, warrant urgent admission for catheterisation and potential abscess drainage. Patients with diabetes or immunosuppression, who have a raised risk of complications, may also benefit from referral to secondary care at the initial point of contact.

CHRONIC BACTERIAL PROSTATITIS AND CHRONIC PELVIC PAIN SYNDROME

Chronic bacterial prostatitis is characterised by symptoms that last more than three months.[1] However, in practice, the diagnosis is often suspected and made earlier on. While the presentation of acute prostatitis is often one of severe infection and sepsis, this is rarely the case in chronic bacterial prostatitis where presentation is less acute but can involve recurrent infective episodes.

Chronic bacterial prostatitis, in which a bacterial cause is identified, is distinct from CPPS, in which it is not. CPPS is far more common, accounting for around 90% of men labelled with either diagnosis and is poorly understood.[8]

Although difficult to estimate due to overlap with other conditions, it is thought that up to 35-50% of men suffer from symptoms suggestive of chronic bacterial prostatitis or CPPS at some stage in their life.

Causes

The causes of chronic bacterial prostatitis include undertreated acute prostatitis,[6] spread from infection elsewhere in the urinary tract (e.g. prostatic or bladder calculi, high residual bladder volumes), or spread of rectal bacteria. The causative pathogens are largely the same as in acute prostatitis, Gram-negative organisms such as *E. coli*, Proteus, Klebsiella and Pseudomonas.[9] Other atypical organisms, such as Mycobacteria and Candida may be identified, particularly in immuno-suppressed patients,[10] and sexually transmitted bacteria may rarely be the cause.[11]

The aetiology of CPPS is poorly understood, and inflammatory, infectious, neuropathic, endocrine and psychological triggers have been linked to the condition.

Presentation

The four symptom domains of chronic bacterial prostatitis and CPPS are urogenital pain, LUTS, symptoms of sexual dysfunction and psychological issues.[12] LUTS, both voiding and storage, are a common presenting complaint for men with chronic bacterial prostatitis and CPPS. Chronic bacterial prostatitis is the most common cause of recurrent UTI in men, and often men will present with recurrent symptoms of infection that are otherwise unexplained.

In CPPS, pain is the predominant symptom, and can be experienced in a range of regions, see table 3, below, as well as following ejaculation or during defecation.

Symptoms of sexual dysfunction can include premature, delayed or painful ejaculation, erectile dysfunction and reduced libido.

The psychological impact of chronic bacterial prostatitis and CPPS should not be underestimated. Depression and anxiety are more common in men with these chronic symptoms and there can be a profound impact on quality of life,[13] particularly in those where pain and sexual dysfunction predominate.

Table 3

Common location of pain in chronic bacterial prostatitis/ chronic pelvic pain syndrome[2]

Prostate/perineum	46%
Scrotum/testes	39%
Penis	6%
Bladder	6%
Lower back	2%

Assessment and diagnosis

Assessment involves characterisation of symptoms, exclusion of differential diagnoses and identifying any potential underlying causes. The nature and severity of symptoms can be explored using the NIH Chronic Prostatitis Symptom Index questionnaire (NIH-CPSI)[14] and other symptom scores (IPSS, IIEF-5). It is crucial to ascertain the man's primary concerns and the impact on his quality of life.

Examination of the abdomen and external genitalia is advised to exclude urinary retention and any obvious cause of symptoms such as phimosis or meatal stenosis. The prostate may be tender or completely normal.

Investigations include dipstick urinalysis, midstream urine culture and STI screen as for acute prostatitis.

PSA testing is controversial in the context of a potentially inflamed prostate, but can be considered following counselling, particularly if there is an abnormal DRE or significant patient concern.

The four-glass (Meares-Stamey) test,[15] the gold standard for identifying an infective cause, whereby sequential urine samples and prostatic secretions are sent for culture, is reserved for secondary care.

Diagnosis of chronic bacterial prostatitis is dependent on the result of urine cultures and prostatic secretions. The diagnosis of CPPS is based on the history and exclusion of the differential diagnoses.

Management

While the identification of a bacterial cause and subsequent differentiation between chronic bacterial prostatitis and CPPS is important, particularly with regards to antibiotic treatment, the management of the two conditions is largely similar and multifactorial.

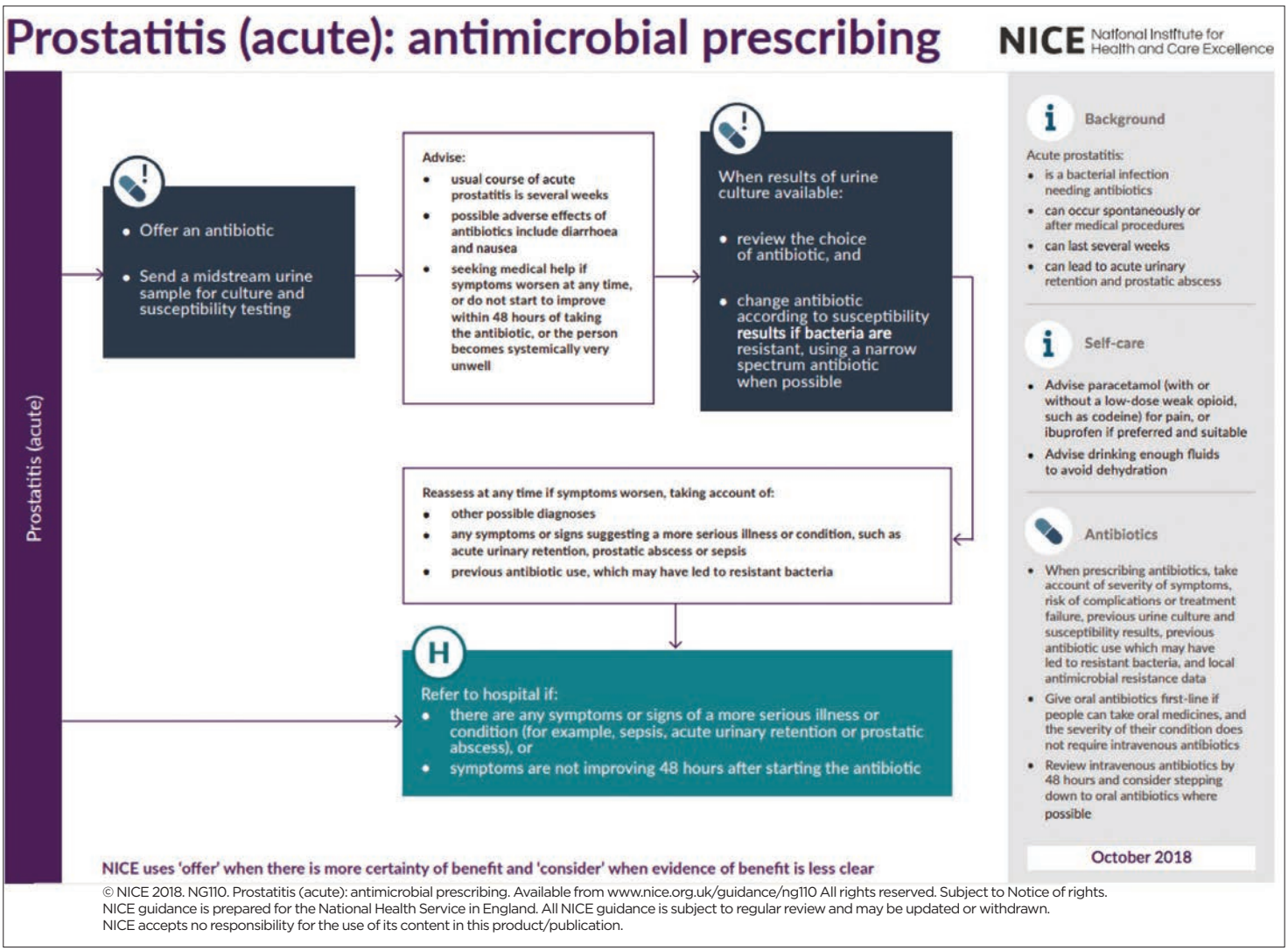
Management of these patients can be challenging, and there is no single management strategy. Treatment should be based on the individual's symptom complex and will often require input from a multidisciplinary team.

Initial management options include empirical antibiotics such as quinolones for 4-6 weeks in antibiotic-naïve men,[9] a trial of alpha-blockers for 4-6 weeks in those with significant LUTS, and simple analgesia in the form of paracetamol with or without NSAIDs. Stool softeners such as lactulose should be considered in men with painful defecation. Subsequent review of the patient's response will determine further management.

Further courses of antibiotics should only be reserved for patients with proven bacterial infection, or significant symptom improvement with the first course of antibiotics.

In patients who do not improve »

FIGURE 1
NICE algorithm for the management of acute prostatitis[7]



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FIGURE 2
Treatment algorithm for chronic bacterial prostatitis (CBP) and chronic pelvic pain syndrome (CPPS)[12]

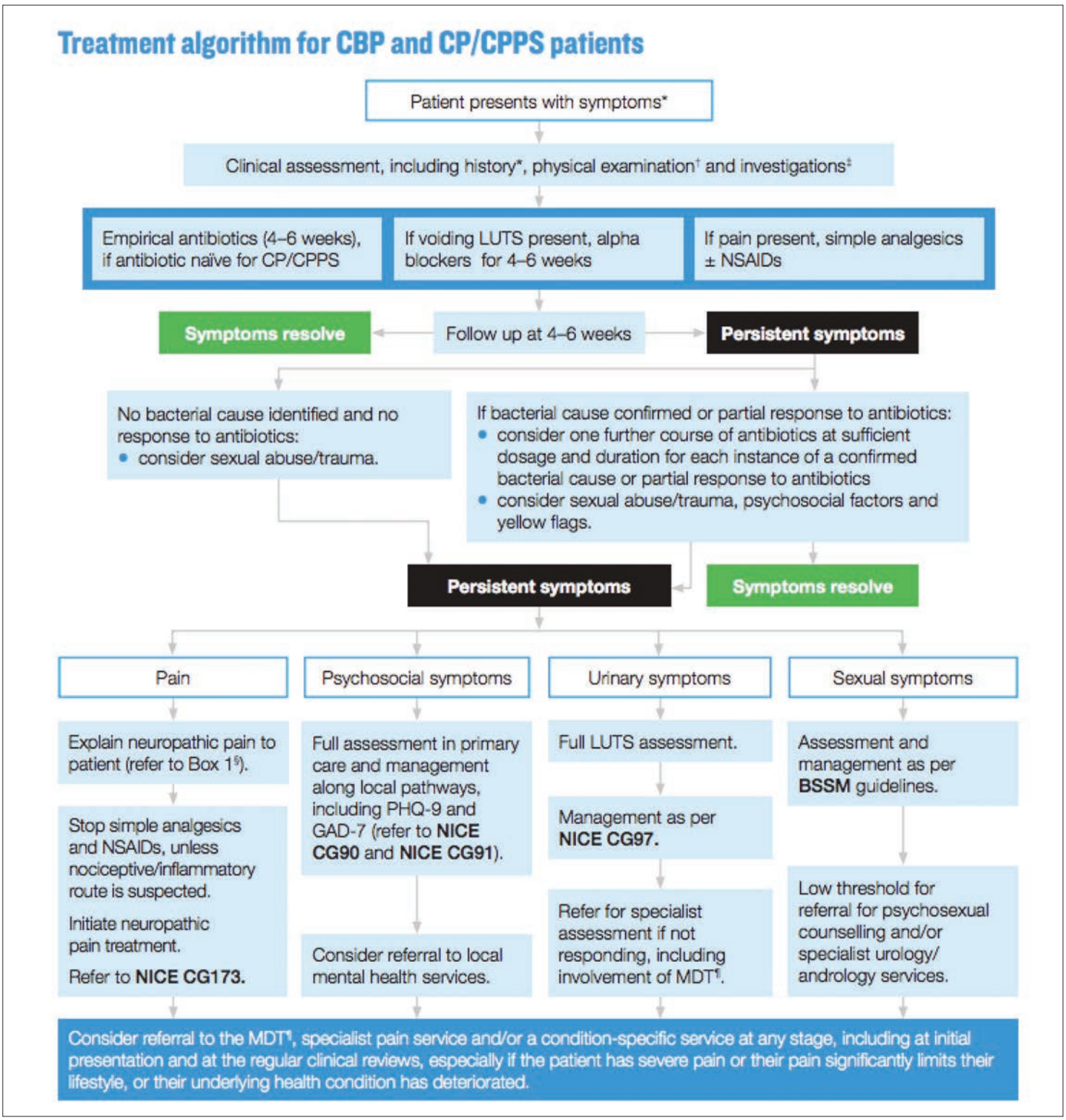
with initial management, a multidisciplinary approach is required, including neuropathic pain management such as gabapentin, phosphodiesterase inhibitors and psychosexual counselling depending on the predominant symptoms.

It is important to keep in mind the psychological factors that may play a role and consider the possibility of sexual abuse and trauma in non-responders.

The consensus guideline from Prostate Cancer UK outlines a useful structured treatment algorithm, see figure 2, below.[12]

Referral

It is generally advisable that these men are referred to a urologist after initial assessment and management, unless



key points

SELECTED BY

Dr Peter Saul
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Acute prostatitis is an acute bacterial infection of the prostate gland, often associated with other urinary tract infections (UTIs). Patients with acute prostatitis present feeling generally unwell with fever, rigors, pelvic pain and lower urinary tract symptoms (LUTS). Acute prostatitis can also present with, or lead to, acute urinary retention. It occurs most commonly through bacteria entering the prostate from the urinary tract. It may follow infection elsewhere in the urinary tract, instrumentation such as endoscopic procedures, transrectal or occasionally transperineal prostate biopsy or catheterisation or can occur spontaneously. The most common pathogens in acute prostatitis are Gram-negative urinary pathogens such as *E. coli*, Proteus, Klebsiella and Pseudomonas spp.

The key diagnostic investigation is a urine dipstick and a confirmatory midstream urine culture prior to commencing antibiotics. A 14-day course of oral antibiotics is advised with fluoroquinolones ciprofloxacin and ofloxacin as the first-line choice. Patients who are systemically unwell should be referred urgently to secondary care for intravenous antibiotics and further investigation, as should those failing to respond appropriately or deteriorating on review after 48 hours.

Chronic bacterial prostatitis is characterised by symptoms that last for more than three months. Causes include undertreated acute prostatitis, spread from infection elsewhere in the urinary tract, or spread of rectal bacteria. The causative pathogens are largely the same as in acute prostatitis. Chronic bacterial prostatitis, in which a bacterial cause is identified, is distinct from chronic pelvic pain syndrome (CPPS), in which it is not. CPPS is far more common, accounting for around 90% of men labelled with either diagnosis and is poorly understood.

The four symptom domains of chronic bacterial prostatitis and CPPS are urogenital pain, LUTS, symptoms of sexual dysfunction and psychological issues. Examination of the abdomen and external genitalia is advised to exclude urinary retention and any obvious cause of symptoms such as phimosis or meatal stenosis. The prostate may be tender or completely normal. Investigations include dipstick urinalysis, midstream urine culture and STI screen as for acute prostatitis.

Initial management options for chronic bacterial prostatitis and CPPS include empirical antibiotics such as quinolones for 4-6 weeks in antibiotic-naïve men, a trial of alpha-blockers for 4-6 weeks in those with significant LUTS, and simple analgesia in the form of paracetamol with or without NSAIDs. Stool softeners such as lactulose should be considered in men with painful defecation. Subsequent review of the patient's response will determine further management. It is generally advisable that these men are referred to a urologist after initial assessment and management, unless they improve dramatically and quickly without any complications.

they improve dramatically and quickly without any complications. There is no clear guidance on the urgency of referral and this should therefore be left to clinical judgement. Men should be referred more urgently to secondary care if there is diagnostic uncertainty or the symptoms are particularly severe. In secondary care, further investigations may include searching for a potential underlying anatomical abnormality, by ultrasound/MRI/flexible cystoscopy, or the four-glass test to identify the presence of bacteria in prostatic secretions absent in urine, as well as involvement of the multidisciplinary team including urologists, pain specialists, nurse specialists, physiotherapists, psychologists and sexual health specialists.

CONCLUSIONS

Acute prostatitis is a potentially serious condition which, once identified, can often be effectively treated with oral antibiotics in primary care, but can lead to severe illness and complications such as urinary retention, prostatic abscess and sepsis. If patients fail to respond to oral antibiotics in 24-48 hours, are at high risk of complications or are systemically unwell, they should be referred to secondary care for inpatient management and further investigation.

Chronic bacterial prostatitis and chronic pelvic pain syndrome are separate entities, based on the presence of a bacterial cause for the symptoms being identified. The management of both is largely similar, and includes the use of an initial trial of antibiotics, alongside multiple adjuncts such as alpha-blockers, neuropathic analgesia, stool softeners, psychological counselling and physiotherapy. Management can be challenging and these patients require multidisciplinary, specialist input if they do not respond well to initial management.

Competing interests: None

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Useful information

NICE
NG110. Prostatitis (acute):antimicrobial prescribing
https://www.nice.org.uk/guidance/ng110/resources/visual-summary-pdf-6544018477

Prostate Cancer UK
Management algorithm for chronic prostatitis and chronic pelvic pain syndrome
https://prostatecanceruk.org/for-health-professionals/guidelines/chronic-prostatitis-and-chronic-pelvic-pain-syndrome

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